

True or False

1. The matrix

$$\begin{pmatrix} 1 & 2 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix}$$

is in reduced row echelon form.

2. A system of three equations in four unknowns is always inconsistent.

3. There is a 3×4 matrix with rank 4.

4. If a matrix A is in rref, then at least one of the entries in each column must be 1.

5.

$$\text{rank} \begin{pmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{pmatrix} = 2$$

6. A nonzero matrix of the form

$$\begin{pmatrix} a & -b \\ b & a \end{pmatrix}$$

has rank 2.

7. If A is an $n \times n$ matrix and \mathbf{x} is a vector in \mathbb{R}^n , then the product $A\mathbf{x}$ is a linear combination of the columns of A .